

two feeble men,
 or two boys, aged fifteen,
 or two strong women,
 or four weak women,
 or four boys, aged seven,
 or four old men, aged eighty-five,

And the respiratory power of a strong woman, aged thirty, is equal to that of
 one feeble man,
 or one boy, aged fifteen,
 or two feeble women,
 or two boys, aged seven,
 or two men, aged eighty-five.

4. The volume of air required by an individual in an *ordinary respiration* augments gradually with the age. The relations between the ages of seven, fifteen, twenty, and eighty, are geometrical, and represented by the numbers—one, two, four, eight. An adult man habitually respire four times as much as an infant, and twice as much as a female of fifteen. An old man respire twice as much as an adult. This progressive increase is the consequence of the diminution of the energy of the pulmonary sanguification—that is to say, this faculty diminishes from infancy to old age, in a ratio represented by fractional numbers, the inverse of those above given, $1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}$.

5. During a forced respiration, the aerial capacity of the lungs, or their permeability to air, presents two periods,—the one ascending from infancy to thirty years,—the other descending from thirty years to old age. The first augments in a regular relation of one, two, three, from seven to fifteen and thirty years; the second diminishes from three to two and a half from thirty to fifty years, and from two and a half to one and a half from fifty to eighty years.

In youth, the respiration is tripled in twenty-three years, and augments one-ninth in each year. From the adult age it diminishes in twenty years two-fifths, or one-hundredth in a year. From fifty to sixty it diminishes but one-fifth in ten years, or one-fiftieth in each year. From sixty to eighty it falls almost one-half more, or one-twentieth in each year.

6. Thus the respiration at any given age may be more or less developed in any subject compared with another, but the rate of diminution is constant in all, and in a nearly equal proportion. The diminution of the respiratory faculty must play a considerable part in the gradual extinction of the vital forces as age advances.

7. In proof of this last proposition, the relation of a forced and ordinary respiration diminishes with the age. It is as one to twelve, at three years of age, as one to ten at fifteen years, as one to nine at twenty years, as one to six at twenty-five and thirty years, as one to three at sixty years, as one to one-half or one-third at eighty years; whence it follows that in youth there is an immense respiratory power in reserve for any violent exertion; while in old age the subject is at once out of breath.

The respiratory faculty is impaired by the capillary rupture of the aerial and sanguiferous canals, improperly called emphysema of the lung. This rupture accompanies more or less, but inevitably, every great respiratory effort. Though it appears to be a senile earring of the lung, it nevertheless commences in infancy, and gradually augments with the age, from the mere reiteration of the function of respiration. All the diseases of the lung, however temporary, hasten this species of disorganization.

The ultimate result of senile emphysema, uncomplicated with any other disease, is to assimilate the cavernous lung, and imperfectly sanguifying respiration of old age to the locular lung and incomplete respiration of the reptile.

As disease, like old age, causes an augmentation of ordinary, and a diminution of forced respiration, this difference affords a new means of diagnosing pulmonary affections.—*Lond. and Edin. Med. Journ. Med. Sci.*, April, 1843.

11. On Menstruation.—M. RACIBORSKI, in a letter to the French Academy of

Medicine, details the results of his researches on menstruation, of which the following are the most important.

1. There exists the most intimate connection between the Graafian vesicles and menstruation. When these vesicles arrive at their full development menstruation commences, and when they are destroyed menstruation ceases.

2. At each menstrual period a follicle projects like a nipple on the surface of the ovary, where it afterwards bursts, without requiring for that purpose an erotic excitation.

3. The rupture of the follicles in general appears to take place just at the period when the menstrual discharge is stopping.

4. The ovaries do not act alternately, as has been affirmed; they do not seem to be under any fixed law as to this.—*Edin. Med. and Surg. Journ.*, April, 1843, from *Bull. de l'Acad.*, Jan. 1843.

12. *Chemical Theory of Nutrition.* By MM. DUMAS and CAHOURS.—For a considerable period chemists have noticed in animals the existence of three neutral azotized principles, remarkable, either on account of the number of properties which are common to all, or on account of their abundance in the fluids or solids of the animal economy, or by their presence in all the essential ingredients of our food. These matters are albumen, fibrin, and casein. The albumen existing in the white of the egg, the fibrin forming the coagulable portion of the blood, the casein constituting the animal part of milk. In a physiologico-chemical essay, read to the Academy of Sciences about eighteen months ago, by MM. Boussingault and Dumas, it was endeavoured to be proved that albumen, casein, and fibrin existed in plants; that these matters passed ready formed in the bodies of the herbivorous animals, from whence they were transferred into those of the carnivora; that plants alone possess the power of forming these three products, which animals separate either for the purpose of assimilating to their own bodies, or to destroy them, according as the wants of their system demand. MM. Dumas and Cahours, in the present memoir, have extended these principles to the formation of the fatty matters, which, they state, take their origin in plants, but in animals undergo a species of combustion, or remain as transitory parts of the body. They have also urged the necessity of grouping together all the organic bodies which possess the property of passing into the state of lactic acid during fermentation, and which, as sugar and starch, form an essential ingredient in the food of man and the lower animals, and are only produced in plants by the powers of vegetation.

The details of these views, and the conclusions drawn from them, may be thus shortly stated.

The vegetable kingdom produces or forms the neutral azotized principles, the fatty matters, sugar, starch, and gum; the animal kingdom, on the other hand, consumes these. The first decomposes the carbonic acid, water, and ammoniacal salts formed by the second; which in its turn absorbs oxygen for the disengagement of these. The animal produces or gives out heat and electricity; the vegetable, on the other hand, absorbs them. The vegetable is a decomposing apparatus which forms new products, and is fixed in one spot; the animal is an oxidizing apparatus, endowed with locomotive powers.

"If, as we hope," continues MM. Dumas and Cahours, "physiologists recognise with us that plants are destined to create albumen, fibrin, casein, but that animals only modify these matters, assimilate them, or destroy them, but cannot create them, we shall esteem ourselves happy, after having been the first to publish such opinions, to be also the first to furnish to science the rigorous analysis of these substances, so often studied for some years past. To avoid confusion, however, it ought to be stated, that, in so far as albumen is concerned, this opinion was previously announced by MM. Prevost and Le Royer, in their *Memoir on Digestion*; but it ought also to be stated that they did not adduce sufficient proofs to convince physiologists. More lately the same opinion was entertained by Mulder, who, reasoning simply on the identity of composition, which he established to exist between vegetable and animal albumen, did not